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## IMPROVEMENTS IN HARD-SIDED LUGGAGE

### BACKGROUND OF THE INVENTION

The invention concerns improvements in hard-sided luggage.

"Hard-sided luggage" means luggage having an all plastic shell exterior. Typically, hard-sided luggage is made by vacuum forming sheet stock (typically made of ABS plastic) over a desired shape. Another common method of making hard-sided luggage is to use an injection molded process. Both known processes have limitations, the most glaring of which is that a clam-shell type design (either 50/50 or 60/40 split) must be used.

The clam-shell 50/50 or 60/40 case has specific functional limitations. One such limitation is strength. When these cases receive a sharp blow, the forces are typically transferred to the general area where the case splits to open, thus causing inadvertent opening of the case. Also, when packing, the top must be filled to use all of the interior space. Practically, this becomes cumbersome as the filled cover must then be lifted and folded shut with its often heavy contents. Although mechanical straps can be used to retain the load, typically the angle, reach and loaded weight make this a cumbersome arrangement. Finally, the clam-shell 50/50 or 60/40 case have a less aesthetically pleasing appearance.

Current "soft-sided" or "gusseted" luggage has the advantage of providing a fabric cover top or an 85/15 gusset, when the top or lid is approximately 15% of the depth of the total container. This type of split is becoming more and more desired by consumers, however, until the invention disclosed herein was not available in hard-sided cases.



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What is needed is a hard-sided case which is made by a different process that can produce such a hard-sided case that will overcome the disadvantages of current hard-sided cases.

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### SUMMARY OF THE INVENTION

The invention has met or exceeded the above-mentioned needs, as well as others. The invention involves using a blow molding process to produce a base and a lid for a hard-sided luggage article. The invention further provides a unique lid structure having a double wall and a base including a Z-beam perimeter. A co-extrusion is provided on the Z-beam, part of the co-extrusion providing a color break when the lid is closed on the base. The other portion of the co-extrusion provides a clip to the Z-beam and ultimately provides the surface for the interlock between the lid and base.

The blow molding process makes it possible to produce a hard-sided luggage article with a trap-door lid. In this way, the parting line between the lid and the base does not extend around the entire sidewall of the case, thus providing a portion of the sidewall which can rest on the floor without the possibility of allowing leakage from a puddle, or the like, to infiltrate into the interior of the case.

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### BRIEF DESCRIPTION OF THE DRAWINGS

A full understanding of the invention can be gained from the following detailed description of the invention when read in conjunction with the accompanying drawings in which:

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Figure 1 is a perspective view of the hard-sided luggage article of the invention.



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Figure 2 is a right side elevational view of the luggage article shown in Figure 1.

Figure 3 is a left side elevational view of the luggage article shown in Figure 1.

5        Figure 4 is a top plan view of the luggage article shown in Figure 1.

Figure 5 is a bottom plan view of the luggage article shown in Figure 1.

10       Figure 6 is a front elevational view of the luggage article shown in Figure 1.

Figure 7 is a back elevational view of the luggage article shown in Figure 1.

Figure 8 is a perspective view of the luggage article of Figure 1 showing the lid being opened.

15       Figure 9 is a cross-sectional view of the lid of the invention.

Figure 10 is a cross-sectional view showing mating of the lid and base and also showing the Z-beam and co-extrusion.

20       DETAILED DESCRIPTION

Referring now to Figures 1-8, the luggage article 20 of the invention will be described. The luggage article 20 is preferably made by (*but not limited to*) a blow molding process wherein an extruded hot plastic (*typically high density polyethylene (HDPE)*) is blown into a cavity mold to create the luggage article 20. This process enables the shapes and designs of the luggage article 20 of the invention to be produced, as opposed to injection molding or vacuum forming which have the limitations discussed above. As can be seen in the figures, blow molding can produce a luggage article 20 having generously curved sides, such sides acting as bumpers to deflect and distribute forces and the impact load.

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Referring back to Figures 1-8, it can be seen that the luggage article 20 is formed with an 85/15 split, having a shallow lid. This is a unique and novel geometry with relation to a hard-sided luggage article which overcomes the above-mentioned disadvantages of typical "clam-shell" prior art hard-sided luggage pieces. As can best be seen in Figure 8, a generous storage compartment 22 is provided within which to place the contents (not shown) desired to be packed. The lid 24 is hingedly secured to the base 26 by means of a hinge 28, creating a "trap-door" like arrangement which maximizes the storage compartment 22 volume while providing other benefits, as will be discussed below.

The lid 24 can be secured to the base 26, when the luggage article 20 is closed, by providing a series of latches or locks, such as latches 30, 32, 34. One or more of these latches can contain a tumbler combination lock for further security. Handles 36, 38 are provided to facilitate carrying the luggage article 20. In addition, the hard-sided luggage article 20 preferably includes two wheels 40, 42 and a conventional integral handle means 50 to allow the luggage article 20 to be wheeled along the ground. These mechanisms are well known in the art.

One aspect of the invention involves the placement of the parting line 60 of the luggage article 20. By "parting line" it is meant the area where the base 24 and lid 26 meet when closed. It is noted that the parting line 60 is generally positioned on the front sidewall 62, left sidewall 64 and right sidewall 66 of the luggage article 20. As can be seen best in Figures 2 and 3, the parting line 60 curves upwardly along the left sidewall 64 and right sidewall 66 and is then disposed generally in the same plane as is the lid 24. Referring to Figure 5, it is appreciated that the parting line 60

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is not generally disposed in the bottom sidewall 68. This will create a novel bottom pan 70 (see *Figure 8*). In this way, there is no parting line on the bottom sidewall 68, which is the sidewall on which the luggage article 20 typically will rest. This is advantageous because in prior art clam-shell designs, the parting line typically is disposed on the bottom sidewall, and because of this, if the luggage article 20 was sat in a puddle or a wet spot, the water in the puddle or wet spot could infiltrate the parting line and make the clothes or other contents of the prior art luggage articles wet. In the novel design of the luggage article 20, the parting line 60 is not disposed on the bottom sidewall 68, thus minimizing the possibility of wet contents if the luggage article 20 is placed in a puddle or the like.

Referring to *Figure 9*, another aspect of the invention will be discussed. Due to the blow molding process, the lid 24 can be made with a double wall, consisting of an outside wall 80 and an inside wall 82. This design will impart strength to the lid 24 by providing intermittent "kiss-points" 83, 84, 85, 86 and 87. These kiss-points contact the inner surface 80a of the outer wall 80. The double wall configuration also allows a liner or other hardware (*not shown*) to be attached to the inside wall 82 without the fasteners or rivets protruding from the outside wall 80. In addition, the lid 24 perimeter is formed with a groove 88 in order to mate with the Z-beam and co-extrusion on the base 24, which will be discussed below.

Referring now to *Figure 10*, several important aspects of the invention will be discussed. The base 24 is formed also by a blow molding process and because of this, a unique Z-beam 100 is formed integral to the base. The Z-beam 100 consists of a portion of the sidewall 101 and includes a horizontal portion 102 and a vertical

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portion 104 extending generally perpendicularly from the horizontal portion 102. The sidewall 101 and horizontal portion 102 form an undercut area 106 which advantageously can ease packing requirements. This is because the contents of the storage compartment 22, such as clothes, can be reasonably tucked under the horizontal portion 102, thus the clothes will not rise above the top line of the base 24, thus making closing of the lid 26 easier. The Z-beam 100 also imparts outstanding lateral rigidity to the base 24 without the need to resort to additional componentry to realize a mechanical advantage.

Figure 10 also shows the co-extrusion clip 120 of the invention. The clip 120 consists of an n-shaped clip portion 122 and a soft horizontal portion 124. The clip 120 is designed to be secured to the vertical portion 104 of the base all around the perimeter thereof, as can be seen in Figure 8. If desired, a break 130 in the clip 120 can be made in order to facilitate placement of the clip 120 onto the vertical portion 104. Preferably, the clip portion 122 is made of a hard plastic material, which nonetheless is constructed and arranged to clip securely onto the vertical portion 104. The soft horizontal portion 124 is made of a softer plastic portion. In addition, the soft horizontal portion 124 can be made of a different color than the base 24 and the lid 26, so that when the luggage article 20 is closed, a color break is created between the lid 26 and the base 24. It will also be appreciated that the lid 26 and base 24 can also be different colors themselves. The key thing to note is that the color of the soft horizontal portion 24 creates a color break no matter what the color or colors of the base 24 and lid 26. The soft portion 124 also is capable of more readily conforming to the bends of the luggage article opening.

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Although the clip 120 is shown preferably as a co-extrusion, it will be appreciated that the invention is not limited thereto, and that the clip can be a single extrusion or a part molded by any other type of process.

5           It will be appreciated that an improved hard-sided luggage article has been disclosed.

While specific embodiments of the invention have been disclosed, it will be appreciated by those skilled in the art that various modifications and alterations to  
10 those details could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of the invention which is to be given the full breadth of the appended claims and  
15 any and all equivalents thereof.